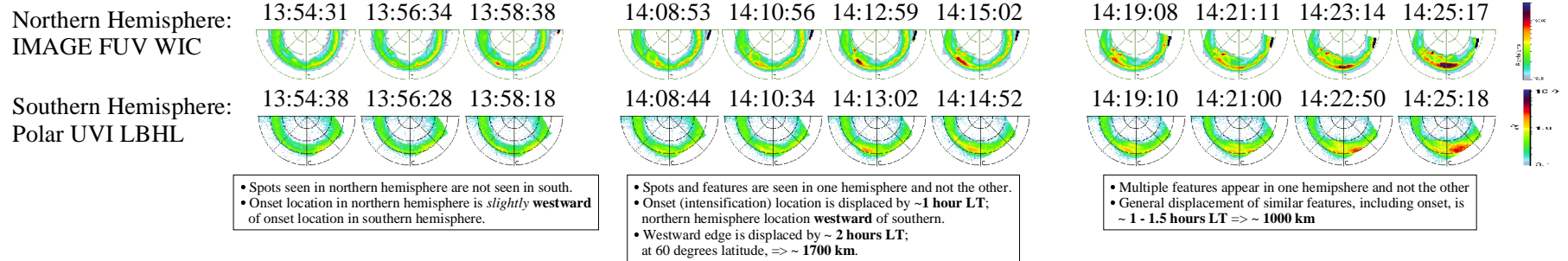


Local Time Displacement of Substorm Expansion in Conjugate Hemispheres

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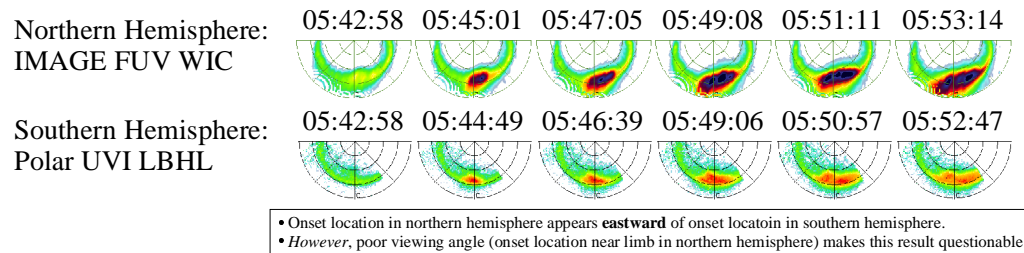
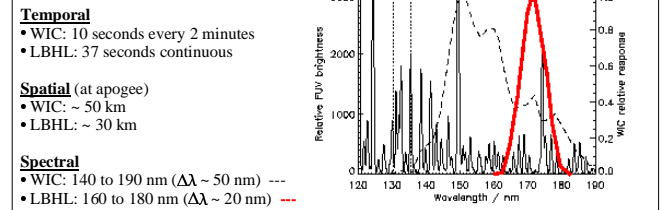
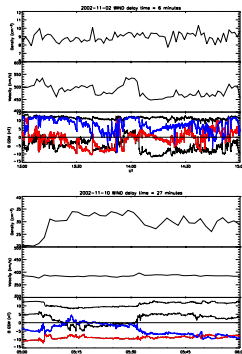
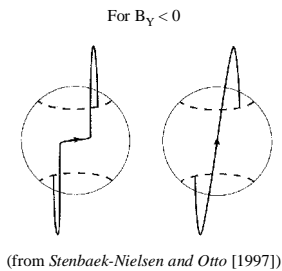


IMAGE FUV WIC & Polar UVI LBHL Resolutions



Possible Explanations/Mechanisms:

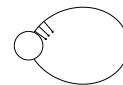
IMF B_Y Penetration



- $B_Y > 0$ during period of observation
- Sense of shift agrees with (mirror of) cartoon
- Just before 14 UT, **large B_Y but small displacement** of auroral forms

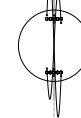
- Large $B_Y < 0$
- Sense of shift agrees with cartoon
- Is observed displacement real?

E_{\perp}



- E_{\perp} (north-south) in one hemisphere will cause particles to drift longitudinally (into the page for the above configuration)
- For constant E_{\perp} extending $1 R_E$ above ionosphere (\approx auroral acceleration region) $E_{\perp} \Rightarrow 10 - 100$ V/m!
- Such large fields are not observed!

J_{\parallel}



- Strong J_{\parallel} sheets associated with intense auroral precipitation will cause a change in the magnetic topology [Kaufmann and Larson, 1989; Donovan, 1993]
- Shift should always be observed in the same direction
- Amount of displacement should depend on the strength of J_{\parallel} (\approx auroral luminosity)

Local Acceleration

- Small scale features in one hemisphere and not the other may be due to local processes occurring at low altitudes
- Substorm onset, intensification, and expansion occur in both hemispheres simultaneously
=> not local processes

Future Work

Which one(s) is it?!